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MECHANICAL PROPERTIES, INCLUDING FRACTURE TOUGHNESS AND FATIGUE, AND RESISTANCE TO STRESS-CORROSION CRACKING OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS

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NOTICE

ABSTRACT

The tensile and some compressive, shear and bearing properties of a total of 90 samples of 2014, 2024, 6061, 7075 and 7178 aluminum alloy extrusions in the TX51X temper have been determined. The extrusions ranged in thicknesses from 0.051 in. to 6.500 in. Ratios among these properties have also been computed.

Stress-corrosion tests of 18 samples of TX51X extrusions have been initiated.

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THIRD QUARTERLY REPORT

MECHANICAL PROPERTIES, INCLUDING FRACTURE TOUGHNESS AND FATIGUE, AND RESISTANCE TO STRESS-CORROSION CRACKING OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS

I. Introduction.

The tests being made under this contract are for use in establishing design mechanical properties in MIL-HDBK-5A, including stress-strain and tangent-modulus curves, for 2014, 2024, 6061, 7075, 7079 and 7178 aluminum alloy extrusions in the TX51X tempers. For comparison, limited similar tests are being made of extrusions in the "heat-treated-by-user" temper. Also, some fracture-toughness, axial-stress fatigue and stress-corrosion tests are being made.

This Third Quarterly Report summarizes the results of tensile and some compressive, shear, bearing and stress-corrosion tests made to date on 90 samples of the various alloys in the TX51X temper. The samples ranged in thickness from 0.051 to 6.500 in.

II. Material.

A total of 92 samples of commercially-produced extrusions in the TX51X temper and 14 samples in the O temper have been received from two producers. The section thickness and identification of each sample is shown in Table I. Twelve of the samples in the O temper have been heat treated or heat treated and aged in accordance with applicable conditions in Mil-H-6088D.

III. Procedure.

Mechanical Properties

Tensile, compressive, shear and bearing specimens were taken at locations described in the Second Quarterly Report, dated September 15, 1966. The general dimensions of these specimens were shown in Figs. 1 to 3 inclusive of the Second Quarterly Report; the testing procedures are as outlined in the First Quarterly Report, dated June 15, 1966.

Some fracture toughness, axial-fatigue and tensile and compressive modulus specimens have been machined. Procedures for testing the fracture toughness and fatigue specimens are described in the First Quarterly Report.

The tensile and compressive specimens to be used for the modulus and stress-strain tests are as shown in Figs. 1 and 2. In all tests of longitudinal tensile specimens, strains will be measured over a 6-in. gage length with an Amsler-Martens mirror-type extensometer. In most of the tests of transverse tensile specimens it will be necessary to use smaller specimens and measure strains over a 4-, 2- or 1-in. gage length. The Amsler-Martens mirror-type extensometer will be used to measure strains over 4- and 2-in. gage lengths; the Tuckerman optical strain gage will be used for the 1-in. gage length. In all compressive tests, the Tuckerman optical strain gage will be used (2- or 1-in. gage length). The Amsler-Martens extensometer over the 6-in. gage length is probably ASTM Class A; over the 4-in. and 2-in. gage length it is an ASTM Class B-1. The Tuckerman extensometer is an ASTM Class A.

Resistance to Stress Corrosion

Stress-corrosion tests were initiated with specimens from 18 samples of TX51X extrusions. Additional samples were selected for corrosion testing, 6 in the TX51X temper and 7 in the heat-treated-by-user or heat-treated-and-aged-by-user temper. Test specimens were machined from these samples and these specimens will be stressed to the desired levels after determination of appropriate tensile properties. The specimens used and the procedures followed are as described in the First Quarterly Report.

IV. Summary.

The results of tensile and some compressive, shear and bearing tests of 90 samples of extrusions in the TX51X temper are as shown in Table II. The tensile properties of all samples exceed the applicable specified minimum values as shown in Table III.

The ratios among the tensile, compressive and shear properties are as shown in Table IV. The ratios among the bearing and tensile properties are as shown in Table V. The ratios among the properties at different locations with regard to width and thickness are as shown in Table VI. The ratios among bearing properties obtained using edgewise specimens to those using flatwise specimens, are shown in Table VII.

The current status of the stress-corrosion tests is given in Table VIII. Preliminary test results show that stress-corrosion cracking has occurred only among specimens from the

2024-T3510 and 7075-T6510 alloy extrusions. Although tests have thus far progressed for a maximum period of only 30 days, these results indicate typical performance of the various materials.

For the same alloy and temper, there sometimes is considerable scatter among certain stresses or ratios of certain stresses. In some cases, it is obvious that there is a trend with thickness. However, trends may also be dependent on other variables, but until a larger percentage of the total number of samples has been tested, it does not seem desirable to try to analyze this situation thoroughly.

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V. Tables and Figures.

TABLE I

SAMPLES OF EXTRUSIONS RECEIVED AS OF DECEMBER 15, 1966
(AF33(615)3580)

201*			2024						6061			7075			178		
Temper	Section Thickness, in.	ARL Sample Number	Temper	Section Thickness, in.	ARL Sample Number	Temper	Section Thickness, in.	ARL Sample Number	Temper	Section Thickness, in.	ARL Sample Number	Temper	Section Thickness, in.	ARL Sample Number	Temper	Section Thickness, in.	Sample Number
-0	0.195	318131*															
	0.300	317925	-0	0.064	318026*				-0	0.246	318090	-0	0.063	318034*	-0	0.051	[illegible]
	0.499	318081		0.087	317855					1.625	317947		0.126	317901			
				0.430	318135*								0.350	317995	-T6510	0.067	[illegible]
-T6510	0.061	317950							-T6510	0.050	318136*		1.225	318043*		0.142	[illegible]
	0.070	318017*	-T3510	0.075	318132*	-T6510	0.075	318022*		0.075	317857		2.250	317923		0.151	[illegible]
	0.073	317951		0.094	318019*		0.094	318134*		0.090	318027*					0.156	[illegible]
	0.246	318130*		0.101	317885		0.101	317887		0.125	317846	-T6510	0.065	317899		0.250	[illegible]
	0.250	340154															
	0.271	317994		0.106	317904		0.106	317888		0.126	317847		0.065	318031*		0.625	[illegible]
	0.625	317952	-T3511	0.120	318018*		0.120	318023*		0.250	317848		0.080	317855		1.250	[illegible]
	0.750	317924	-T3519	0.151	317886		0.151	317889		0.310	317905		0.125	318028*		1.875	[illegible]
	1.657	318046		0.255	317942		0.255	317890		0.315	317953		0.160	318030*		2.180	[illegible]
				0.258	318047		0.258	318082		0.375	317927		0.260	318026*			
				0.375	317943		0.375	317891		0.375	318083		0.313	317900			
				0.510	317926		0.510	317892		0.938	317906		0.375	317954			
				0.525	318020*		0.525	318024*		1.240	317907		0.438	317959			
				0.550	317856		0.550	317922		1.960	317896		0.463	318032*			
													0.935	340155			
				0.642	317945		0.642	317894		6.500	317897		1.023	318033*			
				0.950	317944		0.950	317893					1.188	317960			
				1.150	318077		1.150	318078					1.500	317955			
				1.200	317946		1.200	317895					2.000	317951			
			-T3511	1.450	318021*	-T8511	1.450	318025*					2.190	318037*			
			-T3510	2.250	318133*	-T8510	2.760	318079					3.040	318038*			
				2.750	318048												
												-T73510	0.080	317862			
													0.313	317909			
													0.375	317900			
													0.438	317910			
													.500	317956			
													2.000	317948			

* Producer B; all others from Producer A

TABLE II

MECHANICAL PROPERTIES OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS
[AF33(615)-3580]

Alloy and Temper	Sample: Section Thickness, in.	Sample: Number	Sample: Location*	Sample: Direction†	Tensile Ultimate Stress, psi	Tensile Yield Stress,‡ psi	Elongation in 2 in. or 4D, %	Comp. Yield Stress,‡ psi	Shear Ultimate Stress, psi	Bearing**: Flatwise: Ultimate Stress, psi: e/D=1.5	Bearing**: Flatwise: Ultimate Stress, psi: e/D=2.0	Bearing**: Flatwise: Yield Stress, psi††: e/D=1.5	Bearing**: Flatwise: Yield Stress, psi††: e/D=2.0	Bearing**: Edgewise: Ultimate Stress, psi: e/D=1.5	Bearing**: Edgewise: Ultimate Stress, psi: e/D=2.0	Bearing**: Edgewise: Yield Stress, psi††: e/D=1.5	Bearing**: Edgewise: Yield Stress, psi††: e/D=2.0
2014-T6510	0.061	317950	T/2	L	67 100	62 200	9.0	64 600	—	105 600	138 800	88 200	103 900	—	—	—	—
				LT	74 700	68 600	5.0###	—	—	—	—	—	—	—	—	—	—
	0.070	318017§	T/2	L	64 900	61 900	9.5	62 800	—	104 500	134 900	88 500	103 800	—	—	—	—
	0.073	317951	T/2	L	62 800	59 100	11.5	59 900	—	—	—	—	—	—	—	—	—
	0.246	318130§	T/2	L	64 100	60 400	10.0	61 000	—	—	—	—	—	—	—	—	—
	0.271	317994	T/2	L	67 500	63 800	13.5	63 400	47 200	106 900	139 500	93 400	108 000	—	—	—	—
				LT	71 700	64 600	6.2	—	—	—	—	—	—	—	—	—	—
	0.625	317952	T/2	L	65 900	61 900	14.3	60 300	44 700	—	—	—	—	—	—	—	—
	0.750	317924	T/2	L	76 700	71 100	11.5	73 100	42 800	110 000	142 800	93 600	106 200	—	—	—	—
				LT	70 300	63 500	7.8	68 400	—	—	—	—	—	—	—	—	—
	1.657	318046	T/4	L	72 600	66 100	10.5	67 800	41 500	105 700	135 800	88 000	103 100	—	—	—	—
			T/2	L	73 200	66 500	10.5	68 200	41 500	104 800	132 500	85 700	99 700	—	—	—	—
				LT	67 400	60 200	7.8	—	—	—	—	—	—	—	—	—	—
2024-T3510	0.075	318132§	T/2	L	65 900	53 000	18.0	45 200	—					—	—	—	—
				LT	70 500	48 100	15.0###	57 800	—	—	—	—	—	—	—	—	—
	0.094	318019§	T/2	L	63 900	52 800	14.5		—	97 200	127 800	77 900	92 300	—	—	—	—
	0.101	317885	T/2	L	68 100	53 400	16.5	45 300	—	102 500	125 900	76 200	90 000	—	—	—	—
	0.106	317904	T/2	L	64 400	51 700	20.5	42 100	—	102 200	125 300	77 200	91 100	—	—	—	—
2024-T3511	0.120	318018§	T/2	L	65 400	54 000	17.5	45 000	—	101 900	129 500	79 900	92 600	—	—	—	—
2024-T3510	0.151	317866	T/2	L	69 900	54 400	17.0	45 400	—	102 300	123 600	78 300	91 200	—	—	—	—
				LT	67 700	49 900	11.0###	55 300	—	—	—	—	—	—	—	—	—
	0.255	317942	T/2	L	79 400	61 800	16.0	52 200	43 200	99 100	124 000	74 700	85 000	—	—	—	—
				LT	76 100	55 400	19.0†††	59 900	41 800	105 300	132 100	81 000	99 400	—	—	—	—
	0.258	318047	T/2	L	79 800	60 900	15.0	53 100	43 300	106 300	132 300	81 200	97 000	—	—	—	—
				LT	74 900	54 200	20.0†††	58 100	42 200	107 200	134 400	75 900	97 700	—	—	—	—
	0.375	317943	T/2	L	63 700	49 300	21.5	37 400**	41 600	106 200	133 400	79 500	101 400	—	—	—	—
				LT	57 600	38 900	8.0	—	—	—	—	—	—	—	—	—	—
	0.510	317926	T/2,L/2	L	75 700	57 100	15.0	50 000	40 600	100 600	130 600	77 400	94 800	—	—	—	—
				LT	64 900	48 500	8.0	52 500	39 800	—	—	—	—	—	—	—	—
	0.525	318020§	T/2,W/4	L	63 000	48 300	23.5	39 200	42 200	—	—	—	—	—	—	—	—
				LT	61 500	42 600	11.0	—	—	—	—	—	—	—	—	—	—
			T/2,W/2	L	62 600	48 500	23.0	40 300	41 200	102 000	118 900	74 400	87 900	—	—	—	—
				LT	63 200	43 500	12.0	47 500	42 200	—	—	—	—	—	—	—	—
	0.550	317856	T/2,W/4	L	78 900	62 600	15.5	54 500	40 800	105 100	130 700	79 500	97 300	—	—	—	—
				LT	71 800	53 200	16.4	58 300	39 800	—	—	—	—	—	—	—	—
	0.642	317945	T/2,W/4	L	77 000	60 800	13.6	51 800	40 400	100 900	128 100	76 700	92 300	—	—	—	—
				LT	64 500	47 900	8.5	55 900	39 000	100 600	121 600	76 700	91 600	—	—	—	—
	0.950	317944	T/2,W/4	L	80 900	60 600	15.0	54 400	39 700	102 400	132 200	75 900	90 500	—	—	—	—
				LT	66 500	50 200	15.6	54 000	—	—	—	—	—	—	—	—	—
	1.150	318077	T/2,W/4	L	78 700	61 500	14.5	55 500	39 500	104 000	127 900	78 000	96 100	95 000	124 200	75 600	94 200
				LT	68 800	52 200	10.9	55 300	—	100 000	126 100	78 200	93 900	—	—	—	—
			T/2,W/2	L	76 200	59 200	14.5	51 900	40 100	102 900	129 200	75 400	93 800	—	—	—	—
				LT	69 600	50 700	16.4	54 600	38 400	—	—	—	—	—	—	—	—
	1.200	317946	T/2,W/4	L	80 300	63 500	14.5	56 000	39 900	105 500	134 300	75 400	93 [illegible]00	101 900	130 900	77 900	91 900
				LT	67 200	49 500	14.1	54 000	—	—	—	—	—	—	—	—	—

(Continued)

TABLE II
(Continued)

MECHANICAL PROPERTIES OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS

AF33(615)-3580

Alloy and Temper	Sample: Section Thickness, in.	Sample: Number	Location*	Direction†	Tensile Ultimate Stress, psi	Tensile Yield Stress,* psi	Elongation in 2 in. or 4D, %	Comp. Yield Stress,* psi	Shear Ultimate Stress, psi	Bearing**: Plastics: Ultimate Stress, psi e/D=1.5	Bearing**: Plastics: Ultimate Stress, psi e/D=2.0	Bearing**: Plastics: Yield Stress, psi†† e/D=1.5	Bearing**: Plastics: Yield Stress, psi†† e/D=2.0	Bearing**: Elastics: Ultimate Stress, psi e/D=1.5	Bearing**: Elastics: Ultimate Stress, psi e/D=2.0	Bearing**: Elastics: Yield Stress, psi†† e/D=1.5	Bearing**: Elastics: Yield Stress, psi†† e/D=2.0
2024-T3511	1.450	318021§	T/2,W/4	L	80 400	62 300	14.0	58 100	40 000	105 100	132 200	77 400	92 600	101 900	131 100	75 200	90 700
				LT	68 000	49 000	13.5	52 100	—	—	—	—	—	—	—	—	—
			T/2,W/2	L	79 800	60 800	15.5	56 500	39 700	104 200	129 300	76 500	91 200	100 600	127 600	72 600	90 100
				LT	68 900	49 100	14.6	52 600	39 100	—	—	—	—	—	—	—	—
2024-T3510	2.520	318133§	T/4,W/4	L	81 100	61 500	14.0										
				LT	67 000	46 200	14.1		—	—	—	—	—	—	—	—	—
			T/2,W/2	L	80 900	61 900	14.5										
				LT	67 000	47 000	12.9			—	—	—	—	—	—	—	—
				ST	65 800	44 100	12.5			—	—	—	—	—	—	—	—
	2.760	318048	T/4,W/4	L	77 100	58 800	13.5	54 900	40 900	94 000	118 100	73 400	88 200	94 600	122 700	72 900	91 200
				LT	58 600	43 500	5.2	47 900	37 300	92 600	116 500	74 800	90 900	85 200	111 400	71 200	88 000
			T/2,W/2	L	76 800	58 900	13.5	55 000	39 100	96 600	123 500	76 600	95 900	90 900	118 600	74 100	90 400
				LT	60 500	47 000	6.0	49 700	37 700	91 600	115 400	72 900	90 700	—	—	—	—
				ST	58 900	42 500	6.0	47 800	39 200	—	—	—	—	—	—	—	—
2024-T8510	0.075	318022§	T/2	L	72 400	68 400	6.0	70 000	—	110 200	141 400	98 900	114 800	—	—	—	—
				LT	77 500	69 600	3.0###	73 300	—	—	—	—	—	—	—	—	—
	0.094	318134§	T/2	L	72 900	69 200	7.0		—					—	—	—	—
	0.101	317887	T/2	L	73 200	69 800	6.0	71 500	—	106 800	141 300	95 700	122 400	—	—	—	—
	0.106	317888	T/2	L	74 200	66 200	6.0	66 800	—	107 600	141 500	95 500	117 600	—	—	—	—
	0.120	313023§	T/2	L	71 300	67 700	8.5	67 800	—	109 600	142 300	97 800	110 300	—	—	—	—
	0.151	317889	T/2	L	71 400	67 000	6.5	70 400	—	112 400	144 800	101 200	117 800	—	—	—	—
				LT	75 200	70 300	8.0###	69 600	—	—	—	—	—	—	—	—	—
	0.255	317890	T/2	L	77 600	70 900	8.5	75 500	44 200	113 100	146 600	99 400	117 800	—	—	—	—
				LT	76 600	72 200	10.0†††	73 900	42 900	114 000	146 800	99 900	119 400	—	—	—	—
	0.258	318082	T/2	L	75 400	68 400	7.5	73 100	43 600	118 000	143 800	101 000	115 300	—	—	—	—
				LT	74 800	70 000	9.5†††	71 800	42 800	109 700	141 400	98 700	108 100	—	—	—	—
	0.375	317891	T/2	L	70 100	66 500	7.5	64 800	43 400	107 100	136 800	98 200	107 800	—	—	—	—
				LT	67 700	63 400	4.4	—	—	—	—	—	—	—	—	—	—
	0.510	317892	T/2,W/2	L	73 600	66 700	9.5	70 500	41 600	108 200	139 800	98 000	109 400	—	—	—	—
				LT	71 700	66 900	4.8	69 800	41 500	—	—	—	—	—	—	—	—
	0.525	318024§	T/2,W/4	L	72 200	65 600	10.0	67 500	41 400	104 500	135 300	91 600	106 800	—	—	—	—
				LT	71 000	65 200	5.0	—	—	—	—	—	—	—	—	—	—
			T/2,W/2	L	71 400	64 100	10.5	67 000	40 900	—	—	—	—	—	—	—	—
				LT	70 700	65 000	8.0	64 200	40 600	—	—	—	—	—	—	—	—
	0.550	317922	T/2,W/4	L	74 100	67 800	8.0	70 200	41 300	108 600	139 600	94 800	112 400	—	—	—	—
				LT	72 000	67 200	5.9	69 700	41 200	—	—	—	—	—	—	—	—
	0.642	317894	T/2,W/4	L	75 300	69 000	7.9	70 300	41 700	105 700	135 800	96 600	112 900	—	—	—	—
				LT	71 500	67 800	5.0	70 300	40 100	106 200	137 200	94 100	112 200	—	—	—	—
	0.950	317893	T/2,W/4	L	73 500	68 500	7.5	67 400	41 700	104 000	134 900	96 600	112 200				
				LT	70 100	65 700	4.1	67 900	—	—	—	—	—	—	—	—	—

TABLE II Sheet 2 (Continued)

(Continued)

TABLE II
(Continued)
MECHANICAL PROPERTIES OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS
AF33(615)-3580

Alloy and Temper	Sample: Section Thickness, in.	Sample: Number	Sample: Location*	Sample: Direction†	Tensile Ultimate Stress, psi	Tensile Yield Stress,‡ psi	Elongation in 2 in. or 4D, %	Comp. Yield Stress,‡ psi	Shear Ultimate Stress, psi	Bearing**: Flatwise: Ultimate Stress, psi e/D=1.5	Bearing**: Flatwise: Ultimate Stress, psi e/D=2.0	Bearing**: Flatwise: Yield Stress, psi†† e/D=1.5	Bearing**: Flatwise: Yield Stress, psi†† e/D=2.0	Bearing**: Edgewise: Ultimate Stress, psi e/D=1.5	Bearing**: Edgewise: Ultimate Stress, psi e/D=2.0	Bearing**: Edgewise: Yield Stress, psi†† e/D=1.5	Bearing**: Edgewise: Yield Stress, psi†† e/D=2.0
2024-T6510	1.150	318078	T/2,W/4	L	73 200	66 200	8.5	68 800	40 900	106 900	136 700	94 800	111 000	92 900	127 400	89 700	107 500
				LT	71 200	67 200	5.2	69 300	—	106 300	137 100	96 000	112 600	—	—	—	—
			T/2,W/2	L	71 800	64 900	8.0	69 000	41 000	105 300	136 500	94 300	111 400	—	—	—	—
				LT	71 300	67 100	6.4	67 800	39 900	—	—	—	—	—	—	—	—
	1.200	317895	T/2,W/4	L	74 600	68 500	8.5	70 700	41 500	106 200	135 200	93 800	110 100	101 300	131 000	94 300	110 400
				LT	71 400	67 200	4.6	70 700	—	—	—	—	—	—	—	—	—
2024-T8511	1.450	318025§	T/2,W/4	L	74 800	69 000	9.0	70 500	42 000	106 600	135 500	95 200	112 900	101 900	130 700	91 200	110 100
				LT	70 300	65 700	4.9	69 300	—	—	—	—	—	—	—	—	—
			T/2,W/2	L	74 900	69 000	8.5	70 100	42 200	105 400	137 800	93 700	113 900	101 300	131 700	91 700	111 200
				LT	71 000	66 700	5.4	69 100	41 300	—	—	—	—	—	—	—	—
2024-T8510	2.760	318079	T/4,W/4	L	70 400	63 200	9.0	64 200	40 800	89 200	121 600	***	107 300	95 600	121 900	90 300	105 000
				LT	64 900	60 500	2.4	64 300	39 100	95 100	124 100	90 500	104 600	97 700	126 900	88 900	106 000
			T/2,W/2	L	70 100	63 200	8.5	63 700	40 600	93 700	122 800	89 600	105 400	89 400	118 400	***	108 100
				LT	65 600	61 800	2.0	63 900	41 100	97 000	127 400	87 800	101 700	—	—	—	—
				ST	64 100	59 600	1.8	64 200	39 200	—	—	—	—	—	—	—	—
6061-T6510	0.050	318136§	T/2	L	45 000	42 400	11.0	41 500	—								
	0.075	317857	T/2	L	45 900	39 300	13.0	40 100	—	74 200	91 700	59 400	66 800	—	—	—	—
				LT	44 800	37 200	15.0†††	38 800	—	89 100	105 200	67 400	77 700	—	—	—	—
	0.090	318027§	T/2	L	44 700	42 100	13.5	41 300	—	77 600	103 500	66 200	75 600	—	—	—	—
	0.125	317846	T/2	L	43 200	38 700	11.5	38 700	—	70 900	90 700	58 000	64 300	—	—	—	—
				LT	41 900	36 000	15.0†††	38 600	—	—	—	—	—	—	—	—	—
	0.126	317847	T/2	L	43 900	39 700	10.5	39 800	31 400	—	—	—	—	—	—	—	—
	0.250	317848	T/2	L	43 000	38 500	12.0	38 600	30 800	—	—	—	—	—	—	—	—
	0.310	317905	T/2	L	47 700	43 200	16.5	42 300	31 100	79 500	101 700	66 800	73 200	—	—	—	—
				LT	46 100	43 400	16.5	44 800	30 700	80 700	103 400	67 500	79 500	—	—	—	—
	0.315	317953	T/2	L	45 500	40 200	18.5	40 100	34 400	78 000	100 600	65 700	67 100	—	—	—	—
				LT	44 700	38 000	18.5	40 100	33 600	78 400	103 100	65 300	71 000	—	—	—	—
	0.375	317927	T/2	L	45 900	42 000	18.5	41 600	36 500	80 000	101 400	65 700	70 900	—	—	—	—
				LT	45 300	40 000	17.0	42 000	36 100	80 600	103 700	67 400	75 300	—	—	—	—
	0.375	318083	T/2	L	46 600	42 500	16.0	41 800	35 400	79 800	101 100	68 400	72 600	—	—	—	—
				LT	43 700	39 400	22.5†††	42 000	35 800	81 000	103 400	69 900	75 000	—	—	—	—
	0.918	317906	T/2,W/2	L	45 900	41 800	20.0	41 700	35 000	78 000	101 400	68 500	73 200	—	—	—	—
				LT	45 500	40 800	19.5	43 500	—	—	—	—	—	—	—	—	—
	1.240	317907	T/2;W/4	L	48 100	43 000	18.5	44 800	28 700	—	—	—	—	—	—	—	—
			T/2,W/2	L	48 800	43 500	18.5	44 100	28 400	72 600	94 300	57 900	66 800	71 900	92 100	56 200	66 900
				LT	43 300	37 500	18.0	46 800	—	—	—	—	—	—	—	—	—
	1.960	*317896	T/2,W/4	L	51 500	46 800	18.5	46 800	29 600	76 000	96 600	60 000	71 000	—	—	—	—
			T/2,W/2	L	52 000	47 200	18.5	47 800	29 100	75 100	96 300	60 000	68 900	74 700	96 300	59 700	73 500
				LT	45 200	39 300	17.0	43 000	—	—	—	—	—	—	—	—	—
	6.500	317897	T/4	L	51 500	46 100	13.5	46 000	27 000	72 600	93 800	57 200	71 000	72 600	92 600	57 200	71 000
				LT	44 600	38 000	12.5	40 700	27 000	59 300	89 500	55 400	68 200	68 500	86 600	54 700	67 500
			T/2	L	51 000	45 700	13.5	45 600	26 800	71 500	91 500	56 500	69 500	—	—	—	—
				LT	44 000	37 000	12.5	39 600	26 600	—	—	—	—	—	—	—	—

TABLE II Sheet 3 (Continued)

(Continued)

TABLE II
(Continued)

MECHANICAL PROPERTIES OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS
[AF33(615)-3580]

Alloy and Temper	Sample: Section Thickness, in.	Sample: Number	Sample: Location*	Sample: Direction†	Tensile Ultimate Stress, psi	Tensile Yield Stress,‡ psi	Elongation in 2 in. or 4D, %	Comp. Yield Stress,‡ psi	Shear Ultimate Stress, psi	Bearing**: Plates: Ultimate Stress, psi: e/D=1.5	Bearing**: Plates: Ultimate Stress, psi: e/D=2.0	Bearing**: Plates: Yield Stress, psi†† : e/D=1.5	Bearing**: Plates: Yield Stress, psi†† : e/D=2.0	Bearing**: Extrusions: Ultimate Stress, psi: e/D=1.5	Bearing**: Extrusions: Ultimate Stress, psi: e/D=2.0	Bearing**: Extrusions: Yield Stress, psi†† : e/D=1.5	Bearing**: Extrusions: Yield Stress, psi†† : e/D=2.0
7075-T6510	0.065	317899	T/2	L	87 000	79 200	11.0	75 400	—	126 600	158 400	106 900	123 100	—	—	—	—
	0.065	318031§	T/2	L	86 200	77 700	10.5	77 300	—	125 900	158 700	102 400	125 400	—	—	—	—
				LT	83 600	74 500	12.0***	77 800	—	—	—	—	—	—	—	—	—
	0.080	317858	T/2	L	88 200	81 600	12.0	80 500	—	125 500	159 900	109 600	124 900	—	—	—	—
	0.133	318029§	T/2	L	84 200	75 800	9.0	76 600	—	124 600	156 200	107 000	123 900	—	—	—	—
				LT	82 800	72 600	15.0***	77 900	—	—	—	—	—	—	—	—	—
	0.160	318030§	T/2	L	87 500	79 400	12.0	82 800	—	126 500	160 100	108 600	128 600	—	—	—	—
	0.260	318028§	T/2	L	85 500	77 900	11.5	78 800	48 500	126 100	158 000	104 800	125 400	—	—	—	—
				LT	84 100	74 400	15.0***	—	—	—	—	—	—	—	—	—	—
	0.312	317908	T/2	L	89 400	82 700	11.0	85 300	49 400	—	—	—	—	—	—	—	—
	0.375	317954	T/2	L	88 000	80 900	11.0	79 200	48 000	125 000	160 600	104 400	128 600	—	—	—	—
				LT	83 500	74 600	13.0	82 100	47 100	—	—	—	—	—	—	—	—
	0.438	317859	T/2	L	87 600	80 300	12.0	80 400	49 900	129 100	160 200	113 000	128 500	—	—	—	—
				LT	86 100	77 700	11.5	85 700	48 100	131 000	152 100	112 200	134 200	—	—	—	—
	0.463	318032§	T/2	L	83 800	76 500	12.0	78 300	46 600	121 900	155 400	99 400	119 000	—	—	—	—
				LT	78 700	70 800	10.0	78 400	45 200	—	—	—	—	—	—	—	—
	1.023	318033§	T/2,W/4	L	88 400	82 500	9.0	84 200	47 100	121 000	156 100	100 000	123 100	—	—	—	—
	1.188	317860	T/2,W/4	L	86 600	79 800	11.0	79 500	51 100	126 900	159 400	108 600	121 400	108 900	148 100	98 100	117 200
				LT	84 300	76 300	13.0	81 000	47 900	129 000	158 500	111 500	128 600	112 000	142 900	99 700	120 200
			T/2,W/2	L	85 100	78 000	12.0	77 100	48 200	125 300	155 600	107 400	119 400	110 800	147 100	103 000	119 700
				LT	83 000	74 500	13.0	80 000	47 500	128 700	159 900	110 800	127 800	115 800	148 400	97 500	117 200
	1.500	317955	T/2	L	93 600	86 700	9.5	88 000	48 200	122 400	156 300	102 300	121 400	—	—	—	—
				LT	77 600	67 500	6.2	—	—	—	—	—	—	—	—	—	—
	2.000	317861	T/4	L	93 400	86 700	11.0	86 400	49 200	127 300	164 500	108 000	126 400	—	—	—	—
			T/2	L	91 100	84 100	10.0	84 900	47 700	126 700	155 700	102 300	122 900	—	—	—	—
				LT	79 100	68 700	8.6	75 100	—	—	—	—	—	—	—	—	—
	2.190	318137§	T/4,W/4	L	83 800	76 000	10.0										
				LT	75 000	69 300	3.6										
			T/2,W/2	L	81 700	73 300	10.0										
				LT	77 400	68 800	9.0										
				ST	70 500	61 500	3.9		—	—	—	—	—	—	—	—	—
	3.040	318138§	T/4,W/4	L	86 700	79 100	10.6										
				LT	76 000	67 000	7.0		—								
			T/2,W/2	L	84 400	76 700	10.5										
				LT	75 400	66 700	8.2										
				ST	73 400	63 200	6.0			—	—	—	—	—	—	—	—
7075-T7351	0.080	317862	T/2	L	79 400	71 100	9.0		—					—	—	—	—
	0.313	317909	T/2	L	76 100	66 200	11.5	69 400	44 200	—	—	—	—	—	—	—	—
	0.375	317900	T/2	L	74 900	64 300	11.5	65 800	44 300	113 400	146 300	92 300	109 400	—	—	—	—
				LT	72 600	62 300	11.0	66 600	42 800	—	—	—	—	—	—	—	—
	0.438	317910	T/2	L	77 200	67 500	12.0	69 800	45 100	118 100	152 600	98 900	117 200	—	—	—	—
				LT	76 600	67 600	10.0	71 800	44 100	118 800	152 600	97 600	120 000	—	—	—	—

(Continued)

TABLE II Sheet 4 (Continued)

TABLE II
(Concluded)

MECHANICAL PROPERTIES OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS
[AF33(615)-3580]

Alloy and Temper	Sample: Section Thickness, in.	Sample: Number	Location*	Direction†	Tensile Ultimate Stress, psi	Tensile Yield Stress,‡ psi	Elongation in 2 in. or 4D, %	Comp. Yield Stress,‡ psi	Shear Ultimate Stress, psi	Bearing**: Flatwise: Ultimate Stress, psi: e/D=1.5	Bearing**: Flatwise: Ultimate Stress, psi: e/D=2.0	Bearing**: Flatwise: Yield Stress, psi†† : e/D=1.5	Bearing**: Flatwise: Yield Stress, psi†† : e/D=2.0	Bearing**: Edgewise: Ultimate Stress, psi: e/D=1.5	Bearing**: Edgewise: Ultimate Stress, psi: e/D=2.0	Bearing**: Edgewise: Yield Stress, psi†† : e/D=1.5	Bearing**: Edgewise: Yield Stress, psi†† : e/D=2.0
7075-T73510	1.500	317956	T/2	L	79 700	72 100	11.0	73 800	44 700	111 100	145 700	93 800	111 500	—	—	—	—
				LT	71 800	61 600	6.2	—	—	—	—	—	—	—	—	—	—
	2.000	317948	T/4	L	76 800	71 100	11.5	72 800	44 200	111 400	146 000	90 700	109 400	—	—	—	—
			T/2	L	77 800	70 300	12.0	71 400	43 600	112 200	143 800	92 300	109 400	—	—	—	—
				LT	70 200	60 500	6.2	65 200	—	—	—	—	—	—	—	—	—
7178-T6510	0.063	317902	T/2	L	95 400	89 900	9.5	90 400	—	133 500	168 900	117 400	138 900	—	—	—	—
				LT	94 200	87 500	10.0†††	89 800	—	—	—	—	—	—	—	—	—
	0.142	318016	T/2	L	93 300	86 900	9.5	84 300	—	131 600	166 700	114 900	137 300	—	—	—	—
				LT	92 000	83 400	14.0†††	92 300	—	—	—	—	—	—	—	—	—
	0.154	318035§	T/2	L	92 200	85 500	10.5	90 600	—	138 300	172 600	120 300	138 500	—	—	—	—
	0.162	317904§	T/2	L	91 900	85 400	10.5	89 000	—	132 600	164 400	114 300	129 800	—	—	—	—
	0.265	317998§	T/2	L	95 400	89 400	10.0	89 200	51 800	132 600	166 600	112 700	126 600	—	—	—	—
	0.625	317997	T/2,W/4	L	93 600	86 900	10.7	85 500	51 800	133 400	164 800	114 300	134 900	—	—	—	—
				LT	91 100	81 500	10.2	88 200	50 000	132 400	158 200	113 600	134 200	—	—	—	—
			T/2,W/2	L	92 600	85 900	10.7	89 900	51 800	131 000	166 500	113 600	129 300	—	—	—	—
				LT	89 400	80 700	11.4	87 500	50 200	—	—	—	—	—	—	—	—
	1.200	318139§	T/2,W/4	L	94 900	89 300	9.5	—	—	—	—	—	—	—	—	—	—
				LT	86 300	79 600	8.5										
			T/2,W/2	L	93 200	87 300	9.5										
				LT	85 400	78 900	7.5										
	1.438	317957	T/2	L	101 300	95 500	6.5	97 200	52 500	133 100	167 600	115 700	137 100	—	—	—	—
				LT	85 400	76 900	4.5	—	—	—	—	—	—	—	—	—	—
	2.180	318140§	T/4,W/4	L	91 100	83 300	8.0										
				LT	82 600	75 000	5.0										
			T/2,W/2	L	88 600	79 500	9.0										
				LT	82 400	72 500	6.5										
				ST	76 600	68 600	2.5	—	—	—	—	—	—	—	—	—	—

TABLE II Sheet 5 (Concluded)

* T - Thickness; W - Width
† L - Longitudinal; LT - Long-Transverse
‡ Offset equals 0.2 per cent.
§ Producer B; all others from Producer A

** Specimens and Fixtures cleaned ultrasonically in Tosco 3 solvent.
†† Offset equals 2 per cent of pin diameter.
‡‡ Average of two tests; all others, single tests
††† Bearing specimen failed before reaching yield stress (2 per cent offset).
‡†† Sub-size sheet-type specimen; 1/4-in. wide; 1-in. gage length.
‡‡‡ Sub-size sheet-type specimen; 1/8-in. wide; 1/2-in. gage length.

TABLE III

SPECIFIED MINIMUM VALUES FOR ALUMINUM ALLOY EXTRUSIONS TESTED
[AF 33(615)-3580]

Alloy and Temper	Thickness, in.	Area, sq in.	Tensile Ultimate Stress, psi	Tensile Yield Stress,* psi	Elongation in 2 in. or 4D, %	Federal Specification
2014-T6510	≤0.499	All	60 000	53 000	7	QQ-A-200/2b
	0.500-0.749	All	64 000	58 000	7	
	≥0.750	≤25	68 000	60 000	7	
2024-T3510, -T3511	≤0.249	All	57 000	42 000	12	QQ-A-200/3b
	0.250-0.749	All	60 000	44 000	12	
	0.750-1.499	All	65 000	46 000	10	
	≥1.500	≤25	70 000	52 000	10	
	≥1.500	>25, ≤32	68 000	48 000	8	
-T8510, -T8511	0.050-0.249	All	64 000	56 000	4	
	0.250-1.499	All	66 000	58 000	5	
	≥1.500	≤32	66 000	58 000	5	
6061-T6510	All	All	38 000	35 000	10	QQ-A-200/8b
7075-T6510	≤0.249	All	78 000	70 000	7	QQ-A-200/11b
	0.250-0.499	All	81 000	73 000	7	
	0.500-2.999	All	81 000	72 000	7	
	3.000-4.499	≤20	81 000	71 000	7	
-T73510	≤0.249	---	---	---	--	None
	0.250-0.499	---	---	---	--	
	0.500-2.999	---	---	---	--	
7178-T6510	≤0.249	All	85 000	78 000	5	QQ-A-200/13
	0.250-1.499	All	88 000	79 000	5	
	1.500-2.999	All	86 000	78 000	5	

* Offset equals 0.2 per cent.

TABLE IV

RATIOS AMONG THE TENSILE, COMPRESSIVE AND SHEAR PROPERTIES OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS

[AF33(615)-3580]

Alloy and Temper	Sample Section Thickness, in.	Number	Location*	TUS(LT)/TUS(L)	TUS(ST)/TUS(L)	TYS(LT)/TYS(L)	TYS(ST)/TYS(L)	CYS(L)/TYS(L)	CYS(LT)/TYS(L)	CYS(ST)/TYS(L)	SU(L)/TS(L)	SU(LT)/TS(L)	SU(ST)/TS(L)
2014-T6510	0.061	317950	T/2	1.11	—	1.10	—	1.04	—	—	—	—	—
	0.070	318017†	T/2	—	—	—	—	1.01	—	—	—	—	—
	0.073	317951	T/2	—	—	—	—	1.01	—	—	—	—	—
	0.246	318150†	T/2	—	—	—	—	1.01	—	—	—	—	—
	0.271	317994	T/2	1.06	—	1.01	—	0.99	—	—	0.70	—	—
	0.625	317952	T/2	—	—	—	—	0.97	—	—	0.68	—	—
	0.750	317924	T/2	0.92	—	0.89	—	1.03	0.96	—	0.56	—	—
	1.657	318046	T/4	—	—	—	—	1.03	—	—	0.57	—	—
			T/2	0.93	—	0.91	—	1.03	—	—	0.57	—	—
2024-T3510	0.075	318132†	T/2	1.07	—	0.91	—	0.85	1.09	—	—	—	—
	0.101	317885	T/2	—	—	—	—	0.85		—	—	—	—
	0.106	317904	T/2	—	—	—	—	0.81	—	—	—	—	—
2024-T3511	0.120	318018†	T/2	—	—	—	—	0.83	—	—	—	—	—
2024-T3510	0.151	317886	T/2	0.97	—	0.92	—	0.83	1.01	—	—	—	—
	0.255	317942	T/2	0.96	—	0.90	—	0.84	0.97	—	0.54	0.53	—
	0.258	318047	T/2	0.94	—	0.89	—	0.87	0.95	—	0.54	0.53	—
	0.375	317943	T/2	0.80	—	0.79	—	0.76	—	—	0.65	—	—
	0.510	317926	T/2,W/2	0.86	—	0.85	—	0.88	0.92	—	0.54	0.53	—
	0.525	318020†	T/2,W/4	0.98	—	0.88	—	0.81	—	—	0.67	—	—
			T/2,W/2	1.00	—	0.90	—	0.83	0.98	—	0.65	0.67	—
	0.550	317856	T/2,W/4	0.91	—	0.85	—	0.87	0.93	—	0.52	0.50	—
	0.642	317945	T/2,W/4	0.84	—	0.79	—	0.85	0.92	—	0.52	0.51	—
	0.950	317944	T/2,W/4	0.86	—	0.83	—	0.90	0.89	—	0.49	—	—
	1.150	318077	T/2,W/4	0.87	—	0.85	—	0.90	0.90	—	0.50	—	—
			T/2,W/2	0.88	—	0.82	—	0.84	0.85	—	0.51	0.49	—
	1.200	317946	T/2,W/2	0.84	—	0.78	—	0.91	0.86	—	0.50	—	—
2024-T3511	1.450	318021†	T/2,W/4	0.85	—	0.79	—	0.93	0.94	—	0.50	—	—
			T/2,W/2	0.86	—	0.79	—	0.91	0.84	—	0.49	0.49	—
2024-T3510	2.520	318133†	T/4,W/4	0.83	—	0.75	—						
			T/2,W/2	0.83	0.81	0.76	0.72						
	2.760	318048	T/4,W/4	0.76	—	0.74	—	0.93	0.81	—	0.53	0.48	—
			T/2,W/2	0.78	0.76	0.80	0.72	0.94	0.85	0.81	0.51	0.49	0.51
2024-T8510	0.075	318022†	T/2	1.07	—	1.02	—	1.02	1.07	—	—	—	—
	0.101	317887	T/2	—	—	—	—	1.02	—	—	—	—	—
	0.106	317888	T/2	—	—	—	—	1.01	—	—	—	—	—
	0.120	318023†	T/2	—	—	—	—	1.00	—	—	—	—	—
	0.151	317889	T/2	1.05	—	1.05	—	1.05	1.04	—	—	—	—
	0.255	317890	T/2	0.99	—	1.02	—	1.06	1.04	—	0.57	0.55	—
	0.258	318082	T/2	0.99	—	1.02	—	1.07	1.05	—	0.58	0.57	—
	0.375	317891	T/2	0.97	—	0.95	—	0.97	—	—	0.62	—	—
	0.510	317892	T/2,W/2	0.97	—	1.00	—	1.06	1.05	—	0.57	0.56	—
	0.525	318024†	T/2,W/4	0.98	—	0.99	—	1.03	—	—	0.63	—	—
			T/2,W/2	0.98	—	0.99	—	1.02	0.98	—	0.57	0.56	—

(Continued)

TABLE IV
(Continued)

RATIOS AMONG THE TENSILE, COMPRESSIVE AND SHEAR PROPERTIES OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS
[AF33(615)-3580]

Alloy and Temper	Sample Section Thickness, in.	Number	Location*	TUS(LT)/TUS(L)	TUS(ST)/TUS(L)	TYS(LT)/TYS(L)	TYS(ST)/TYS(L)	CYS(L)/TYS(L)	CYS(LT)/TYS(L)	CYS(ST)/TYS(L)	SU(L)/TUS(L)	SU(LT)/TUS(L)	SU(ST)/TUS(L)
2024-T8510	0.550	317922	T/2,W/4	0.97	--	0.99	--	1.04	1.03	--	0.56	0.56	--
	0.642	317894	T/2,W/4	0.95	--	0.98	--	1.02	1.02	--	0.55	0.55	--
	0.950	317893	T/2,W/4	0.95	--	0.96	--	0.98	0.99	--	0.57	--	--
	1.150	318078	T/2,W/4	0.97	--	1.02	--	1.04	1.05	--	0.56	--	--
			T/2,W/2	0.97	--	1.01	--	1.04	1.02	--	0.56	0.55	--
	1.200	317895	T/2,W/4	0.96	--	0.95	--	1.03	1.03	--	0.56	--	--
2024-T8511	1.450	318025†	T/2,W/4	0.94	--	0.98	--	1.02	1.00	--	0.56	--	--
			T/2,W/2	0.95	--	0.97	--	1.02	1.00	--	0.56	0.56	--
2024-T8510	2.760	318079	T/4,W/4	0.92	--	0.96	--	1.02	1.02	--	0.56	0.56	--
			T/2,W/2	0.93	0.91	0.98	0.94	1.01	1.01	1.02	0.56	0.56	0.56
6061-T6510	0.050	318136†	T/2	--	--	--	--	0.98	--	--	--	--	--
	0.075	317857	T/2	0.98	--	0.96	--	1.02	0.99	--	--	--	--
	0.090	318527*	T/2	--	--	--	--	0.98	--	--	--	--	--
	0.125	317846	T/2	0.97	--	0.93	--	1.00	1.00	--	--	--	--
	0.125	317847	T/2	--	--	--	--	1.00	--	--	0.72	--	--
	0.250	317848	T/2	--	--	--	--	1.01	--	--	0.72	--	--
	0.310	317905	T/2	1.03	--	1.00	--	0.98	1.04	--	0.65	0.64	--
	0.375	317853	T/2	0.98	--	0.95	--	1.00	1.00	--	0.76	0.74	--
	0.375	317907	T/2	0.99	--	0.95	--	0.99	1.00	--	0.80	0.79	--
	0.375	318003*	T/2	0.94	--	0.91	--	0.98	0.99	--	0.76	0.73	--
	0.625	317906	T/2,T/2	0.99	--	0.96	--	1.00	1.04	--	0.72	--	--
	1.240	317907	T/2,T/4	--	--	--	--	1.04	--	--	0.68	--	--
			T/2,T/2	0.89	--	0.86	--	1.01	0.94	--	0.58	--	--
	1.960	317856	T/2,T/4	--	--	--	--	1.00	--	--	0.57	--	--
			T/2,T/2	0.87	--	0.82	--	1.00	0.92	--	0.56	--	--
	6.500	317897	T/4	0.87	--	0.82	--	1.00	0.88	--	0.52	0.52	--
			T/2	0.89	--	0.86	--	0.99	0.86	--	0.52	0.52	--
7075-T6510	0.063	317899	T/2	--	--	--	--	0.95	--	--	--	--	--
	0.090	318031†	T/2	0.97	--	0.96	--	0.99	1.00	--	--	--	--
	0.125	318030†	T/2	--	--	--	--	0.98	--	--	--	--	--
	0.125	318029*†	T/2	0.98	--	0.96	--	1.01	1.03	--	--	--	--
	0.250	318028*†	T/2	--	--	--	--	1.04	--	--	--	--	--
	0.250	318027*†	T/2	0.98	--	0.96	--	1.01	--	--	--	--	--
	0.375	317900	T/2	--	--	--	--	1.04	--	--	0.57	--	--
	0.375	317954	T/2	--	--	--	--	1.04	--	--	0.55	--	--
	0.375	317955	T/2	0.95	--	0.92	--	0.98	1.01	--	0.55	0.54	--
	0.625	317956	T/2	0.95	--	0.97	--	1.00	1.07	--	0.57	0.55	--
	0.625	318032*†	T/2	0.94	--	0.93	--	1.02	1.02	--	0.56	0.54	--
	1.000	318033*†	T/2,W/4	--	--	--	--	1.02	--	--	0.53	--	--

(Continued)

TABLE IV (Sheet 2 of 3 Sheets)

TABLE IV
(Concluded)

RATIOS AMONG THE TENSILE, COMPRESSIVE AND SHEAR PROPERTIES
OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS
[AF33(615)-3580]

Alloy and Temper	Sample Section Thickness, in.	Sample Number	Location*	TYS(LT)/TUS(L)	TYS(ST)/TUS(L)	TYS(LT)/TYS(L)	TYS(ST)/TYS(L)	CYS(L)/TYS(L)	CYS(LT)/TYS(L)	CYS(ST)/TYS(L)	SU(L)/TS(L)	SU(LT)/TS(L)	SU(ST)/TS(L)
7075-T6510	1.188	317860	T/2,W/4	0.97	—	0.96	—	1.00	1.02	—	0.59	0.55	—
			T/2,W/2	0.96	—	0.93	—	0.97	1.00	—	0.56	0.55	—
	1.500	317955	T/2	0.85	—	0.78	—	1.01	—	—	0.51	—	—
	2.000	317861	T/4	—	—	—	—	1.00	—	—	0.52	—	—
			T/2	0.87	—	0.82	—	1.01	0.99	—	0.52	—	—
	2.190	318137†	T/4,W/4	0.89	—	0.91	—						
			T/2,W/2	0.92	0.84	0.91	0.81						
	3.040	318138†	T/4,W/4	0.88	—	0.85	—			—			—
			T/2,W/2	0.87	0.85	0.84	0.80						
7075-T73510	.312	317909	T/2	—	—	—	—	1.05	—	—	0.67	—	—
	.375	317900	T/2	0.97	—	0.97	—	1.02	1.04	—	0.59	0.57	—
	0.438	317910	T/2	0.99	—	1.00	—	1.03	1.06	—	0.58	0.57	—
	1.500	317956	T/2	0.90	—	0.85	—	1.02	—	—	0.56	—	—
	2.000	317948	T/4	—	—	—	—	1.02	—	—	0.56	—	—
			T/2	0.90	—	0.86	—	1.02	0.93	—	0.56	—	—
7178-T6510	0.063	317902	T/2	0.99	—	0.97	—	1.01	1.04	—	—	—	—
	0.142	318016	T/2	0.99	—	0.96	—	0.97	1.06	—	—	—	—
	0.154	318035†	T/2	—	—	—	—	1.06	—	—	—	—	—
	0.162	317903	T/2	—	—	—	—	0.98	—	—	—	—	—
	0.265	317996	T/2	—	—	—	—	1.00	—	—	0.54	—	—
	0.625	317997	T/2,W/4	0.97	—	0.94	—	0.98	1.01	—	0.55	0.52	—
			T/2,W/2	0.96	—	0.93	—	0.97	1.01	—	0.55	0.54	—
	1.200	318139†	T/2,W/4	0.91	—	0.89	—			—			—
			T/2,W/2	0.90	—	0.88	—			—			—
	1.438	317957	T/2	0.84	—	0.81	—	1.02	—	—	0.55	—	—
	2.180	318140†	T/4,W/4	0.91	—	0.90	—			—			—
			T/2,W/2	0.90	0.84	0.88	0.80						

* T - Thickness; W - Width
† Producer B; all others from Producer A

TABLE IV Sheet 3 (Concluded)

TABLE V

RATIOS OF BEARING TO TENSILE PROPERTIES OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS
[AF33(615)-3560]

Alloy and Temper	Sample: Section Thickness, in.	Sample: Number	Sample: Location*	Flatwise: [illegible]								Edgewise: [illegible]							
				e/D=1.5	e/D=2.0	e/D=1.5	e/D=2.0	e/D=1.5	e/D=2.0	e/D=1.5	e/D=2.0	e/D=1.5	e/D=2.0	e/D=1.5	e/D=2.0	e/D=1.5	e/D=2.0	e/D=1.5	e/D=2.0
2014-T6510	0.061	317950	T/2	1.57	2.07	1.42	1.67	—	—	—	—	—	—	—	—	—	—	—	—
	0.070	318017†	T/2	1.61	2.08	1.42	1.58	—	—	—	—	—	—	—	—	—	—	—	—
	0.271	317994	T/2	1.58	2.07	1.46	1.69	—	—	—	—	—	—	—	—	—	—	—	—
	0.750	317924	T/2	1.43	1.86	1.32	1.49	—	—	—	—	—	—	—	—	—	—	—	—
	1.657	318046	T/4	1.46	1.87	1.33	1.56	—	—	—	—	—	—	—	—	—	—	—	—
			T/2	1.44	1.82	1.30	1.51	—	—	—	—	—	—	—	—	—	—	—	—
2024-T3510	0.094	318019†	T/2	1.52	2.00	1.48	1.75	—	—	—	—	—	—	—	—	—	—	—	—
	0.101	317885	T/2	1.51	1.86	1.43	1.69	—	—	—	—	—	—	—	—	—	—	—	—
	0.106	317904	T/2	1.59	1.95	1.49	1.76	—	—	—	—	—	—	—	—	—	—	—	—
2024-T3511	0.120	318018†	T/2	1.56	1.98	1.46	1.71	—	—	—	—	—	—	—	—	—	—	—	—
2024-T3510	0.151	317885	T/2	1.46	1.77	1.44	1.68	—	—	—	—	—	—	—	—	—	—	—	—
	0.255	317942	T/2	1.25	1.56	1.21	1.38	1.33	1.66	1.31	1.6	—	—	—	—	—	—	—	—
	0.258	318047	T/2	1.33	1.66	1.33	1.59	1.34	1.68	1.25	1.60	—	—	—	—	—	—	—	—
	0.375	317943	T/2	1.67	2.09	1.61	2.06	—	—	—	—	—	—	—	—	—	—	—	—
	0.510	317926	T/2,W/2	1.33	1.73	1.36	1.66	—	—	—	—	—	—	—	—	—	—	—	—
	0.525	318020†	T/2,W/2	1.62	1.89	1.54	1.82	—	—	—	—	—	—	—	—	—	—	—	—
	0.550	317856	T/2,W/4	1.35	1.66	1.27	1.55	—	—	—	—	—	—	—	—	—	—	—	—
	0.542	317945	T/2,W/4	1.31	1.66	1.26	1.52	1.31	1.58	1.26	1.51	—	—	—	—	—	—	—	—
	0.950	317944	T/2,W/4	1.27	1.63	1.22	1.49	—	—	—	—	—	—	—	—	—	—	—	—
	1.150	318077	T/2,W/4	1.32	1.63	1.27	1.56	1.27	1.60	1.27	1.53	1.21	1.58	1.23	1.53	—	—	—	—
			T/2,W/2	1.31	1.64	1.23	1.53	—	—	—	—	—	—	—	—	—	—	—	—
	1.200	317946	T/2,W/4	1.31	1.67	1.19	1.47	—	—	—	—	1.27	1.63	1.23	1.45	—	—	—	—
2024-T3511	1.150	318021*	T/2,W/4	1.31	1.64	1.24	1.49	—	—	—	—	1.27	1.63	1.21	1.46	—	—	—	—
			T/2,W/2	1.30	1.61	1.23	1.46	—	—	—	—	1.25	1.59	1.17	1.45	—	—	—	—
2024-T3510	2.760	318048	T/4,W/4	1.22	1.52	1.25	1.50	1.20	1.51	1.27	1.55	1.1[illegible]	1.59	1.24	1.55	1.11	1.44	1.21	1.50
			T/2,W/2	1.25	1.61	1.30	1.60	1.19	1.50	1.24	1.54	1.18	1.54	1.26	1.54	—	—	—	—
2024-T3510	0.075	318022†	T/2	1.52	1.95	1.45	1.68	—	—	—	—	—	—	—	—	—	—	—	—
	0.101	317827	T/2	1.46	1.93	1.37	1.75	—	—	—	—	—	—	—	—	—	—	—	—
	0.106	317568	T/2	1.53	2.04	1.44	1.78	—	—	—	—	—	—	—	—	—	—	—	—
	0.120	318023†	T/2	1.54	2.00	1.44	1.63	—	—	—	—	—	—	—	—	—	—	—	—

(Continued)

TABLE V
(Continued)
RATIOS OF BEARING TO TENSILE PROPERTIES OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS
[AF33(615)-358C]

Alloy and Temper	Sample: Section Thickness, in.	Sample: Number	Sample: Location*	Flatwise: $\frac{F_{BUS}(L)}{F_{TUS}(L)}$ e/D=1.5	Flatwise: $\frac{F_{BUS}(L)}{F_{TUS}(L)}$ e/D=2.0	Flatwise: $\frac{F_{BYS}(L)}{F_{TYS}(L)}$ e/D=1.5	Flatwise: $\frac{F_{BYS}(L)}{F_{TYS}(L)}$ e/D=2.0	Flatwise: $\frac{F_{BUS}(LT)}{F_{TUS}(L)}$ e/D=1.5	Flatwise: $\frac{F_{BUS}(LT)}{F_{TUS}(L)}$ e/D=2.0	Flatwise: $\frac{F_{BYS}(LT)}{F_{TYS}(L)}$ e/D=1.5	Flatwise: $\frac{F_{BYS}(LT)}{F_{TYS}(L)}$ e/D=2.0	Edgewise: $\frac{F_{BUS}(L)}{F_{TUS}(L)}$ e/D=1.5	Edgewise: $\frac{F_{BUS}(L)}{F_{TUS}(L)}$ e/D=2.0	Edgewise: $\frac{F_{BYS}(L)}{F_{TYS}(L)}$ e/D=1.5	Edgewise: $\frac{F_{BYS}(L)}{F_{TYS}(L)}$ e/D=2.0	Edgewise: $\frac{F_{BUS}(LT)}{F_{TUS}(L)}$ e/D=1.5	Edgewise: $\frac{F_{BUS}(LT)}{F_{TUS}(L)}$ e/D=2.0	Edgewise: $\frac{F_{BYS}(LT)}{F_{TYS}(L)}$ e/D=1.5	Edgewise: $\frac{F_{BYS}(LT)}{F_{TYS}(L)}$ e/D=2.0
2024-T8510	0.151	317889	T/2	1.57	2.03	1.51	1.76	--	--	--	--	--	--	--	--	--	--	--	--
	0.255	317890	T/2	1.46	1.89	1.40	1.66	1.47	1.88	1.41	1.68	--	--	--	--	--	--	--	--
	0.258	318082	T/2	1.48	1.91	1.48	1.69	1.45	1.88	1.44	1.68	--	--	--	--	--	--	--	--
	0.375	317891	T/2	1.53	1.95	1.48	1.62	--	--	--	--	--	--	--	--	--	--	--	--
	0.510	317892	T/2	1.47	1.96	1.47	1.64	--	--	--	--	--	--	--	--	--	--	--	--
	0.525	315024*	T/2,W/4	1.45	1.87	1.40	1.63	--	--	--	--	--	--	--	--	--	--	--	--
	0.550	317893	T/2,W/4	1.47	1.88	1.40	1.66	--	--	--	--	--	--	--	--	--	--	--	--
	0.642	317894	T/2,W/4	1.40	1.80	1.40	1.64	1.41	1.82	1.36	1.63	--	--	--	--	--	--	--	--
	0.950	317895	T/2,W/4	1.41	1.84	1.41	1.64	--	--	--	--	--	--	--	--	--	--	--	--
	1.150	318079	T/2,W/4	1.46	1.87	1.43	1.66	1.45	1.87	1.45	1.70	1.27	1.74	1.35	1.62	--	--	--	--
			T/2,W/2	1.44	1.86	1.42	1.68	--	--	--	--	--	--	--	--	--	--	--	--
	1.200	317895	T/2,W/4	1.42	1.81	1.37	1.61	--	--	--	--	1.36	1.76	1.38	1.61	--	--	--	--
2024-T3511	1.450	315025*	T/2,W/4	1.43	1.81	1.36	1.64	--	--	--	--	1.36	1.75	1.32	1.60	--	--	--	--
			T/2,W/2	1.41	1.84	1.37	1.65	--	--	--	--	1.35	1.76	1.33	1.61	--	--	--	--
2024-T8510	2.760	313079	T/2,W/4	1.27	1.73	**	1.70	1.35	1.76	1.43	1.66	1.36	1.73	1.43	1.66	1.39	1.80	1.41	1.69
			T/2,W/2	1.33	1.74	1.42	1.67	1.35	1.81	1.39	1.61	1.27	1.68	**	1.71	--	--	--	--
6061-T6510	0.075	317887	T/2	1.62	2.00	1.51	1.71	1.84	2.29	1.72	1.98	--	--	--	--	--	--	--	--
	0.090	317888*	T/2	1.74	2.03	1.50	1.65	--	--	--	--	--	--	--	--	--	--	--	--
	0.125	317886	T/2	1.62	2.10	1.52	1.68	--	--	--	--	--	--	--	--	--	--	--	--
	0.250	317884	T/2	1.66	2.13	1.55	1.66	1.68	2.17	1.56	1.84	--	--	--	--	--	--	--	--
	0.313	317885	T/2	1.71	2.21	1.58	1.68	1.78	2.27	1.62	1.77	--	--	--	--	--	--	--	--
	0.375	317883	T/2	1.74	2.21	1.58	1.66	1.75	2.26	1.60	1.79	--	--	--	--	--	--	--	--
	0.375	318080	T/2	1.71	2.21	1.61	1.71	1.74	2.22	1.64	1.76	--	--	--	--	--	--	--	--
	0.918	317890	T/2,W/2	1.70	2.21	1.64	1.75	--	--	--	--	--	--	--	--	--	--	--	--
	1.040	317891	T/2,W/2	1.60	1.99	1.53	1.64	--	--	--	--	1.47	1.89	1.29	1.54	--	--	--	--
	1.150	317892	T/2,W/2	1.47	1.89	1.38	1.58	--	--	--	--	--	--	--	--	--	--	--	--
			T/2,W/2	1.44	1.85	1.27	1.46	--	--	--	--	1.44	1.86	1.26	1.52	--	--	--	--
	6.500	317897	T/2	1.43	1.88	1.24	1.54	1.35	1.74	1.20	1.44	1.41	1.80	1.24	1.54	1.33	1.66	1.19	1.44
			T/2	1.39	1.71	1.03	1.46	--	--	--	--	--	--	--	--	--	--	--	--
7075-T6510	0.065	317899	T/2	1.46	1.82	1.35	1.65	--	--	--	--	--	--	--	--	--	--	--	--
	0.065	318081*	T/2	1.43	1.86	1.38	1.61	--	--	--	--	--	--	--	--	--	--	--	--

(Continued)

TABLE V
(Concluded)

RATIOS OF BEARING TO TENSILE PROPERTIES OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS
[AF33(615)-3580]

Alloy and Temper	Sample: Section Thickness, in.	Sample: Number	Sample: Location*	Flatwise: BYS(L)/TYS(L) e/D=1.5	Flatwise: BYS(L)/TYS(L) e/D=2.0	Flatwise: BYS(LT)/TYS(LT) e/D=1.5	Flatwise: BYS(LT)/TYS(LT) e/D=2.0	Flatwise: BYS(T)/TYS(T) e/D=1.5	Flatwise: BYS(T)/TYS(T) e/D=2.0	Edgewise: BYS(L)/TYS(L) e/D=1.5	Edgewise: BYS(L)/TYS(L) e/D=2.0	Edgewise: BYS(LT)/TYS(LT) e/D=1.5	Edgewise: BYS(LT)/TYS(LT) e/D=2.0	Edgewise: BYS(T)/TYS(T) e/D=1.5	Edgewise: BYS(T)/TYS(T) e/D=2.0
7075-T6510	0.080	317856	T/2	1.49	1.81	1.34	1.53	—	—	—	—	—	—	—	—
	0.133	3180294	T/2	1.48	1.86	1.41	1.63	—	—	—	—	—	—	—	—
	0.150	3180304	T/2	1.55	1.89	1.37	1.62	—	—	—	—	—	—	—	—
	0.250	3180284	T/2	1.47	1.86	1.35	1.58	—	—	—	—	—	—	—	—
	0.375	317854	T/2	1.42	1.82	1.28	1.56	—	—	—	—	—	—	—	—
	0.438	317855	T/2	1.47	1.84	1.41	1.60	1.50	1.75	1.40	1.67	—	—	—	—
	0.469	3180324	T/2	1.45	1.85	1.30	1.56	—	—	—	—	—	—	—	—
	1.000	3180344	T/2, W/4	1.37	1.77	1.21	1.49	—	—	—	—	—	—	—	—
	1.188	317860	T/2, W/4	1.47	1.84	1.36	1.58	1.49	1.83	1.40	1.61	1.26	1.71	1.23	1.47	1.20	1.65	1.25	1.51
			T/2, W/2	1.45	1.80	1.35	1.57	1.49	1.85	1.28	1.48	1.28	1.70	1.25	1.50	1.34	1.71	1.22	1.47
	1.500	317855	T/2	1.31	1.67	1.18	1.40	—	—	—	—	—	—	—	—	—	—	—	—
	2.000	317861	T/4	1.36	1.76	1.25	1.46	—	—	—	—	—	—	—	—	—	—	—	—
			T/2	1.29	1.67	1.10	1.32	—	—	—	—	—	—	—	—	—	—	—	—
7075-T73510	0.375	317900	T/2	1.51	1.93	1.44	1.70	—	—	—	—	—	—	—	—	—	—	—	—
	0.438	317910	T/2	1.53	1.88	1.47	1.74	1.54	1.98	1.45	1.78	—	—	—	—	—	—	—	—
	1.500	317956	T/2	1.49	1.88	1.36	1.58	—	—	—	—	—	—	—	—	—	—	—	—
	2.000	317942	T/4	1.44	1.80	1.28	1.54	—	—	—	—	—	—	—	—	—	—	—	—
			T/2	1.42	1.82	1.30	1.54	—	—	—	—	—	—	—	—	—	—	—	—
7178-T6510	0.063	317902	T/2	1.40	1.77	1.31	1.55	—	—	—	—	—	—	—	—	—	—	—	—
	0.142	317915	T/2	1.41	1.78	1.32	1.56	—	—	—	—	—	—	—	—	—	—	—	—
	0.154	3180354	T/2	1.50	1.85	1.42	1.61	—	—	—	—	—	—	—	—	—	—	—	—
	0.188	317903	T/2	1.44	1.79	1.34	1.52	—	—	—	—	—	—	—	—	—	—	—	—
	0.266	317906	T/2	1.39	1.75	1.26	1.40	—	—	—	—	—	—	—	—	—	—	—	—
	0.625	317937	T/2, W/4	1.43	1.76	1.32	1.55	1.41	1.76	1.31	1.54	—	—	—	—	—	—	—	—
			T/2, W/2	1.40	1.76	1.31	1.48	—	—	—	—	—	—	—	—	—	—	—	—
	1.438	317957	T/2	1.31	1.65	1.21	1.44	—	—	—	—	—	—	—	—	—	—	—	—

* T - Thickness; W - Width
\+ Producer B; all others from Producer A

** Bearing specimen failed before reaching yield stress (2 per cent offset).
Note: L - Longitudinal; LT - Long-Transverse

TABLE VI

RATIOS AMONG THE MECHANICAL PROPERTIES AT DIFFERENT LOCATIONS
[AF33(615)-3580]

Alloy and Temper	Sample: Section Thickness, in.	Sample: Number	Direction*	Location†	Tensile Ultimate Stress	Tensile Yield Stress	Compressive Yield Stress	Shear Ultimate Stress	Bearing: Ultimate Stress e/D=1.5	Bearing: Ultimate Stress e/D=2.0	Bearing: Yield Stress e/D=1.5	Bearing: Yield Stress e/D=2.0
2014-T6510	1.657	318046	L	$\frac{T}{2}/\frac{T}{4}$	1.01	1.01	1.01	1.00	0.99	0.98	0.97	0.97
2024-T3510	0.525	318020**	L	$\frac{W}{2}/\frac{W}{4}$	0.99	1.00	1.03	0.98	—	—	—	—
			LT		1.03	1.02	—	—	—	—	—	—
	1.150	318077	L	$\frac{W}{2}/\frac{W}{4}$	0.97	0.96	0.94	1.01	0.99	1.01	0.97	0.98
			LT		1.01	0.97	0.99	—	—	—	—	—
2024-T3511	1.450	318021**	L	$\frac{W}{2}/\frac{W}{4}$	0.99	0.98	0.97	0.99	0.99	0.98	0.99	0.98
					—	—	—	—	0.99*	0.97*	0.97*	0.99*
			LT		1.01	1.00	1.01	—	—	—	—	—
2024-T3510	2.520	318133**	L	$\frac{T}{2}/\frac{T}{4}$	1.00	1.01	—	—	—	—	—	—
			LT		1.00	1.02	—	—	—	—	—	—
	2.760	318048	L	$\frac{T}{2}/\frac{T}{4}$	1.00	1.00	1.00	0.96	1.03	1.05	1.04	1.06
									0.96*	0.97*	1.02*	0.99*
			LT		1.03	1.06	1.04	1.01	0.99	0.99	0.97	1.00
2024-T3510	0.525	318024**	L	$\frac{W}{2}/\frac{W}{4}$	0.99	0.98	0.99	0.99	—	—	—	—
			LT		1.00	1.00	—	—	—	—	—	—
	1.150	318078	L	$\frac{W}{2}/\frac{W}{4}$	0.98	0.98	1.00	1.00	0.99	1.00	0.99	1.00
			LT		1.00	1.00	0.98	—	—	—	—	—
2024-T3511	1.450	318025**	L	$\frac{W}{2}/\frac{W}{4}$	1.00	1.00	0.99	1.00	0.99	1.02	0.98	1.01
					—	—	—	—	0.99*	1.01*	1.01*	1.01*
			LT		1.01	1.02	1.00	—	—	—	—	—
2024-T3510	2.760	318079	L	$\frac{T}{2}/\frac{T}{4}$	1.00	1.00	0.99	1.00	1.05	1.01	***	0.98
					—	—	—	—	0.94*	0.97*	***†	1.03*
			LT		1.01	1.02	0.99	1.03	1.02	1.03	0.97	0.97

(Continued)

TABLE VI
(Concluded)
RATIOS AMONG THE MECHANICAL PROPERTIES AT DIFFERENT LOCATIONS
[AF33(615)-3580]

Alloy and Temper	Sample Section Thickness, in.	Sample Number	Direction*	Location†	Tensile Ultimate Stress	Tensile Yield Stress	Compressive Yield Stress	Shear Ultimate Stress	Bearing Ultimate Stress e/D=1.5	Bearing Ultimate Stress e/D=2.0	Bearing Yield Stress e/D=1.5	Bearing Yield Stress e/D=2.0
6061-T6510	1.240	317907	L	W/2/4	1.01	1.01	0.98	0.99	—	—	—	—
	1.960	317896	L	W/2/L	1.01	1.01	1.02	0.98	0.99	1.00	1.00	0.97
	6.500	317897	L	T/2/4	0.99	0.99	0.99	0.99	0.98	0.98	0.99	0.95
			LT		0.99	0.97	0.97	0.99	—	—	—	—
7075-T6510	1.188	317860	L	W/2/4	0.96	0.95	0.97	0.94	0.99	0.96	0.99	0.96
					—	—	—	—	1.02*	0.99*	1.02*	1.02*
			LT		0.98	0.96	0.99	0.99	1.00	1.01	0.99	0.99
					—	—	—	—	1.03*	1.04*	0.98*	0.98*
	2.000	317861	L	T/2/4	0.96	0.97	0.98	0.97	0.95	0.95	0.95	0.97
	2.190	318137**	L	T/2/W/L	0.97	0.96						
					1.03	0.99						
	3.040	318138**		T/2/W/L	0.97	0.97						
					0.99	1.00						
7075-T73510	2.000	317948		T/2/4	0.99	0.98	0.98	0.99	1.01	0.98	1.02	1.00
7178-T6510	0.625	317937	L	W/2/4	0.99	0.99	0.98	1.00	0.98	1.01	0.99	0.96
			LT		0.98	0.99	0.99	1.00	—	—	—	—
	1.200	318139**	L	W/2/4	0.98	0.98						
			LT		0.99	0.99						
	2.180	318140**	L	T/2/W/L	0.97	0.95						
			LT		1.00	0.98						

TABLE VI Sheet 2 (Concluded)

* L - Longitudinal; LT - Long-Transverse
† T - Thickness; W - Width
‡ Edgewise bearing specimens; others - flatwise specimens
** Producer B; all others from Producer A

TABLE VII

RATIOS OF BEARING PROPERTIES IN THE EDGEWISE DIRECTION TO THOSE IN THE FLATWISE DIRECTION FOR STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS

Alloy and Temper	Sample: Section Thickness, in.	Sample: Number	Location*	Direction†	Edgewise/Flatwise: BUS(E)/BUS(F) e/D=1.5	BUS(E)/BUS(F) e/D=2.0	BYS(E)/BYS(F) e/D=1.5	BYS(E)/BYS(F) e/D=2.0
2024-T3510	1.150	318077	T/2,W/4	L	0.91	0.97	0.97	0.98
	1.200	317946	T/2,W/4	L	0.97	0.98	1.03	0.98
2024-T3511	1.450	318021‡	T/2,W/4	L	0.97	0.99	0.97	0.98
			T/2,W/2	L	0.97	0.99	0.95	0.99
2024-T3510	2.760	318048	T/4,W/4	L	1.01	1.04	0.99	1.03
				LT	0.92	0.96	0.95	0.97
			T/2,W/2	L	0.94	0.96	0.97	0.96
2024-T8510	1.150	318078	T/2,W/4	L	0.87	0.93	0.95	0.97
	1.200	317895	T/2,W/4	L	0.95	0.97	1.01	1.00
2024-T8511	1.450	318025‡	T/2,W/4	L	0.96	0.96	0.96	0.98
			T/2,W/2	L	0.96	0.96	0.98	0.98
2024-T8510	2.760	318079	T/4,W/4	L	1.07	1.00	**	0.98
				LT	1.03	1.02	0.98	1.01
			T/2,W/2	L	0.95	0.96	**	1.03
6061-T6510	1.240	317907	T/2,W/2	L	0.99	0.98	0.97	1.00
	1.960	317896	T/2,W/2	L	0.99	1.00	1.00	1.02
	6.500	317897	T/4	L	1.00	0.99	1.00	1.00
				LT	0.99	0.97	0.99	0.99
7075-T6510	1.188	317860	T/2,W/4	L	0.86	0.93	0.90	0.97
				LT	0.87	0.90	0.89	0.93
			T/2,W/2	L	0.88	0.95	0.93	1.00
				LT	0.90	0.93	0.88	0.92

* T - Thickness; W - Width

† L - Longitudinal; LT - Long-Transverse

‡ Producer B; all others from producer A

** Bearing specimen failed before reaching yield stress (2 per cent offset).

TABLE VIII

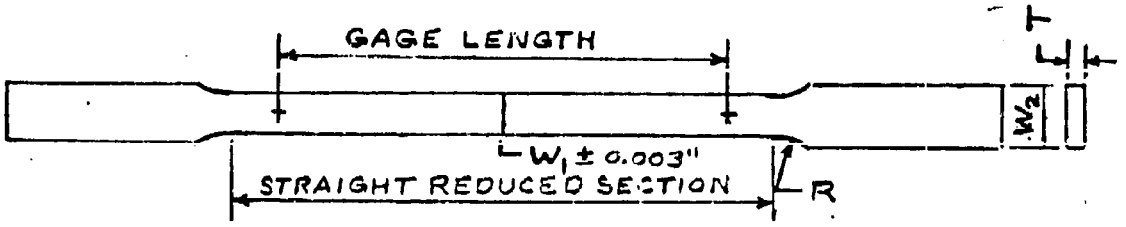
RESISTANCE TO STRESS-CORROSION CRACKING OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS

Alloy	Sample: Section Thickness, In.	Sample: Number	Stress 75% Yield Strength*: Longitudinal F/N+	Longitudinal Days	Long Transverse F/N	Long Transverse Days	Short Transverse F/N	Short Transverse Days
2024-T3510	0.255	317942	0/2	30	0/2	30	---	----
	0.510	317926	0/2	30	0/2	30	---	----
	0.950	317944++	0/2	30	0/2	30	2/2	6, 6
	1.200	317946++	0/2	30	2/2	7, 7	2/2	6, 6
2024-T8510	0.255	317890	0/2	30	0/2	30	---	----
	0.510	317892	0/2	30	0/2	30	---	----
	0.950	317893++	0/2	30	0/2	30	0/2	16
	1.200	317895++	0/2	30	0/2	30	0/2	16
6061-T6510	0.315	317953	0/2	30	0/2	30	---	----
	0.375	317927	0/2	30	0/2	30	---	----
	1.240	317907	0/2	30	0/2	30	---	----
	1.960	317896	0/2	30	0/2	30	---	----
7075-T6510	0.375	317954	0/2	30	1/2	17,30	---	----
	0.438	317859	0/2	30	0/2	30	---	----
	1.188	317860++	0/2	30	0/2	30	2/2	6, 6
7075-T73510	0.375	317900	0/2	30	0/2	30	---	----
	0.438	317910	0/2	30	0/2	30	---	----
7178-T6510	0.625	317997	0/2	30	0/2	30	---	----

Notes:
- * Specimens used are described in the first Quarterly Report.
- \+ F/N denotes number of specimens failed over number exposed.
- ++ Short transverse yield strengths obtained by tests of duplicate 0.050" diameter tension specimens.

S. - No.	Yield Strength, psi
317944	49 000
317946	48 200
317893	65 000
317895	65 700
317860	73 600

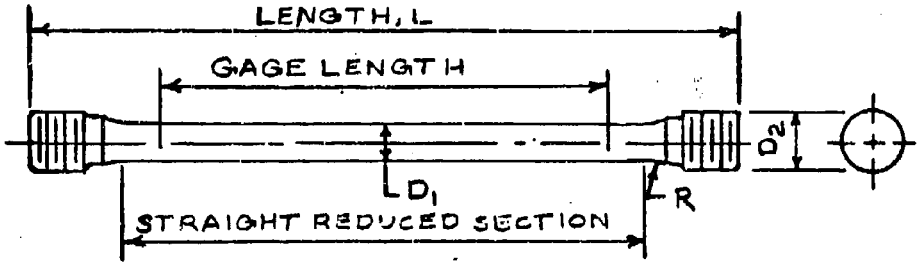
TABLE VIII



WIDTH, IN.		GAGE LENGTH, IN.	REDUCED SECTION LENGTH, IN.	RADIUS (R), IN.	THICKNESS, (T), IN.
W_1	W_2				
0.500 ± 0.003	3/4	6.000 ± 0.002	7 *	7/8	≥ 0.499
0.250 ± 0.002	3/8	1.000 ± 0.002	1-1/2	3/8	≥ 0.250

* FOR SOME LONG-TRANSVERSE SPECIMENS, GAGE LENGTHS ARE 4 IN., REDUCED-SECTION LENGTHS ARE 5 IN.

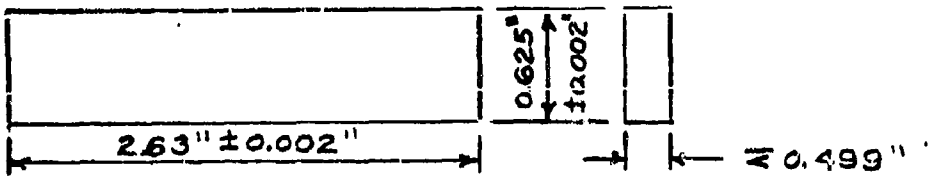
Sheet-Type Specimens



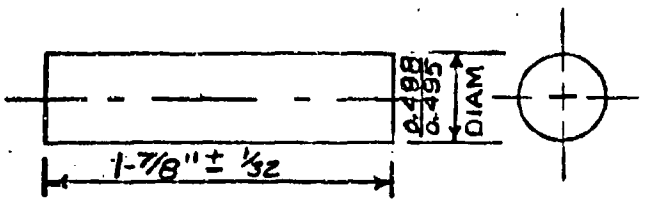
DIAMETER, IN.		GAGE LENGTH, IN.	REDUCED SECTION LENGTH, IN.	RADIUS (R), IN.	LENGTH (L), IN.
D_1	D_2				
0.500 ± 0.003	3/4	6.000 ± 0.002	7	5/8	9-1/2
0.500 ± 0.003	3/4	4.000 ± 0.002	5	5/8	7-1/2
0.500 ± 0.003	3/4	2.000 ± 0.002	3	5/8	5-1/2
0.438 ± 0.003	5/8	2.000 ± 0.002	2-7/8	≥ D_1	5-1/4
0.375 ± 0.003	9/16	2.000 ± 0.002	2-3/4	≥ D_1	5

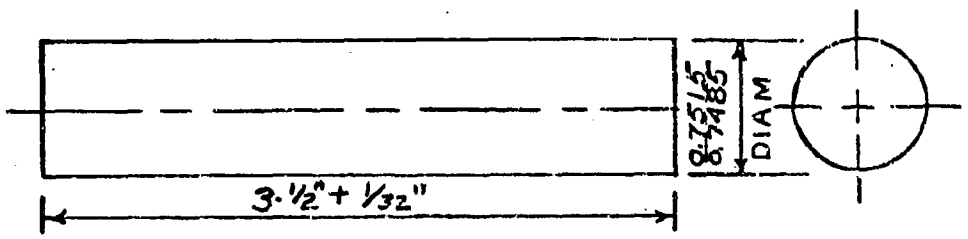
Round Specimens

Fig. 1 General Dimensions of Tensile Specimens For Modulus and Stress-Strain Tests



Sheet-Type Specimen





Round Specimens

Fig. 2 General Dimensions of Compressive Specimens For Modulus and Stress-Strain Tests